

### Flawless flight

The crew of STS-70 share memories of one of the most perfect flights to date. Story on Page 3.



### Plaque hanging

Two groups share honors on hanging the STS-70 plaque in Mission Control. Story on Page 4.

# Space News Roundup

Vol. 34

August 4, 1995

No. 31

## ISD upgrades E-mail systems

In a move to standardize and update the JSC electronic mail system, the Information Systems Directorate began taking steps to eliminate Office Vision, also known as, PROFS.

"The Office Vision product is hosted on a computer system at the NASA Automated Computer Center at the Marshall Space Flight Center," said Jane Stearns, director of ISD. "When the JSC need for Office Vision is eliminated, we anticipate that MSFC will be able to eliminate the computer system, thereby saving significant NASA software licensing and system support costs. We are attempting to get everyone and all applications moved before the end of November so we will have a one month overlap period before asking the NACC to turn off Office Vision."

Office Vision, which provides electronic mail, calendars, bulletin boards, the JSC telephone directory and access to documentation and on-line forms, will be replaced by up-to-date software products such as MSmail, Schedule+, and server based bulletin boards. ISD will provide migration support for all on-site personnel and applications.

The move to provide common site-wide, Integrated Network Services, will allow all personnel at JSC to connect to all other JSC employees, easily send and receive electronic mail and files to people across the world via the information superhighway, Internet and gain access to needed data repositories and computers.

"ISD is replacing the individual, isolated networks at JSC with a common infrastructure that allows us to consider replacing outdated systems like Office Vision, saving money for the agency while improving the overall communications," Stearns said. "To date, several major networks have been integrated into the INS and plans are in place to integrate the last large independent network into INS."

Access to the world through identified points will help JSC control costs by eliminating the replication of development and sustaining support of those points, while aiding the overall security of our on-site systems.

ISD has sent electronic mail messages to Office Vision users that do not have JSC MSmail to let them know plans and to give them a point of contact for establishing an MSmail account. Customer Services Team representatives from ISD will work with organizations to develop plans to transfer all Office Vision work to other products. Paul Stull of ISD is the project manager, coordinating the plans for elimination and interface with the NACC.



The STS-69 crew participate in the Terminal Countdown Demonstration Test. From left are, Mission Specialists James Voss and James Newman, Commander Dave Walker, Mission Specialist Mike Gernhardt and Pilot Ken Cockrell.

NASA Photo

## Space station gains support

(Editor's note: The following analysis was prepared by Jeff Bingham who is currently serving as Legislative Affairs Coordinator in the Space Station Program Office.)

By Jeff Bingham

After a week of spirited debate the U.S. House of Representatives approved the VA, HUD, and Independent Agencies appropriations bill Monday night, by a vote of 228-193.

The bill includes NASA appropriations for FY 1996. The good news from the House consideration of the Appropriations bill is that the International Space Station received its strongest vote of confidence yet from the Congress, in the defeat of two separate "killer" amendments with overwhelming margins of victory in both votes.

"This week's votes in the House of Representatives are reassuring, both because of the sizable margin by which members defeated two similar amendments to end the space station program and because of the issues which appear to have motivated these strong votes of confidence," said Randy Brinkley, manager of the Space Station Program Office. "It is becoming increasingly clear that we are in charge of our own destiny. If we continue to perform well, keep the program on schedule, on budget and with its research capabilities intact, I believe we will continue to have the support of the Congress

and of the American People. We also need to continue to educate the American public on the importance of the International Space Station's research to the future of our nation."

On July 27 the House of Representatives voted 299 to 126 to defeat an amendment offered by Representative David Obey, D-Wis., which would have terminated the space station

program and, after providing for contract termination costs, distributed \$1.4 million among programs providing veterans health care, housing for the elderly, low income and disabled and other science, especially non-station NASA science. The remainder, roughly \$500 million, was to remain unspent, as a contribution to deficit reduction.

On July 28, Representative Tim Roemer, D-Ind., offered his own amendment to terminate the space station. It was defeated by a vote of 287 to 132—a 155 vote margin. Just over a year previously, on June

29, 1994, a similar amendment was defeated by a vote of 278 to 155—a 123 vote margin which, until this past week, was the largest vote in support of the space station in the past five years. Just two years ago, an amendment to terminate the space station program was defeated by just a single vote in the House.

"Boeing is very gratified that the administration, the House leadership and the people of

Please see CONGRESS, Page 4

### Amendments to terminate International Space Station

June 1993	House—215-216 (4 absent) 1 vote margin.
June 1993	House—196-220 (19 absent), 24 vote margin.
Sept. 1993	Senate—40-59 (1 absent), 19 vote margin.
Nov. 1993	House—184-248 (3 absent), 64 vote margin.
June 1994	House—155-278 (2 absent), 123 vote margin.
Aug. 1994	Senate—36-64, 28 vote margin.
July 1995	House—132-287 (16 absent), 155 vote margin.
July 1995	House—126-299 (10 absent), 173 vote margin.

## Endeavour rolls back

Mother Nature and mechanical analysis dominated the week's attention for NASA managers and engineers as they continue to assess options for a new launch date for *Endeavour* on the STS-69 mission.

With *Endeavour's* liftoff on hold, NASA managers decided Tuesday to roll the shuttle back to the Vehicle Assembly Building at Kennedy Space Center as a precautionary measure against the possible effects of Hurricane Erin as the storm neared the Florida coast. The rollback is not expected to have an effect on a new launch date for *Endeavour* and the shuttle was expected to return to its oceanside launch pad by week's end.

In the meantime, engineers neared a decision on whether to conduct repairs to RTV (room temperature vulcanized) sealant around nozzle joint O-rings on the shuttle's Reusable Solid Rocket Motors out on Launch Pad 39-A at KSC.

The launch of *Endeavour* on the fifth shuttle flight of the year was indefinitely postponed to enable engineers to solve what is believed to be the presence of air pockets in the RTV in the No. 3 nozzle joint of the shuttle's RSRMs, similar to those which apparently caused hot gas to create a heating effect on the primary O-ring of the left-hand booster nozzle joint No. 3 on *Atlantis* during the STS-71 launch and in the right-hand booster nozzle joint No. 3 on *Discovery* during the STS-70 launch.

"We believe the joint itself has an excellent, sturdy, viable design," said Brewster Shaw, director of shuttle operations. "What we're dealing with is the process by which the RTV is applied within the joint around the O-rings."

It is thought that the air pockets are created when engineers inject the RTV putty-like substance into a crevice called a "backfill" to create a thermal barrier which is designed to deflect hot gas away from the primary and secondary O-rings in the solid rocket boosters' nozzle joints during the first two minutes of flight after launch.

During the last two launches, hot gas has crept through the air pockets to leave pinpoint-heat spots on the primary O-ring in the nozzle joint, enough to force NASA managers to review processing procedures.

"Safety of flight, is, and will be, our primary concern," said Shaw. "We will correct the problem to improve our performance and our margins in that joint."

One option under consideration by technicians is an "excavation" and reapplication of the RTV to the nozzle joint with *Endeavour* out on the launch pad. Solid rocket motor experts were still refining procedures for the work as the week drew to a close.

Preliminary estimates indicate that *Endeavour* is expected to be launched by the end of the month, although officially, the launch has been delayed until no earlier than mid-August.

Meanwhile, the STS-69 crew, Commander Dave Walker, Pilot Ken Cockrell, Mission Specialists Jim Voss, Jim Newman and Mike Gernhardt continue training in preparation for *Endeavour's* liftoff.

Major objectives for the crew include deployment of a pair of satellites and a space walk to test tools and techniques for the International Space Station.

The SPARTAN-201 solar science satellite will be released into orbit on the second day of the mission by robot arm operator Gernhardt for a 48-hour free flight to train its instruments on the solar corona and the Sun's

Please see WSF, Page 4



## Employees earn certificate of commendation

Several JSC employees will be honored with a Certificate of Commendation in a ceremony to be held at 3:30 p.m. Wednesday at the Gilruth Center.

The JSC Certificate of Commendation is JSC's highest honorary award and will be presented to approximately 90 employees. Dr. Huntoon will present the awards, assisted by the appropriate director or program manager.

Recipients of the Certificate of Commendation include, Office of Chief Information Officer, Lee Snapp; Office of Public Affairs,

Stephen Nesbitt; Business Management Directorate, Sally Branson, Donna Blackshear-Reynolds, Wayne Thomas, Rodney Etchberger, Gail Boyes, Roberta Beckman, Carrie Ash, Cinda Chullen, Patrick Kidwell and Carol Lattier; Flight Crew Operations, Patrick Forrester, Michael Clifford, Michael Knapp, Peter Wisoff, Carl Walz, Gloria Demers and Jaime Forero; Mission Operations Directorate, Michael DeMasie, Barbara Pearson, Ken Bain, John Hoover, Georgie Huepers, James Ortiz, B. Keith Todd, Barbara Severance,

Thadd Bowers, Michelle Truly, Michael Thompson and Jennifer Price; Engineering Directorate, William Schneider, Lewis Casey, Robert Rice, Robert Wren, Stanley Donahoe, Paula Beckstrom, Nanette Cerna, James Skipper, Glenn Lutz, Aldo Bordano, Louis Nguyen, Steven Labbe, Shirley Newsom, Horst Ehlers, Jesse Adkins, Christy Herring, Warren Brasher, John Applewhite, Norman Luksa, Gary Gutkowski, Lisa Thwaites, R. Harry St. John, Ying-Ming Kuo, John Schliesing, Yuan-Chyau Chang, Andrew Benjamin

and Mary Harris; JSC Projects Office, Richard Fullerton, David Adlis, Karla Smith and Michael Odaka; Center Operations Directorate, Graciela Ferris, Dennis Perrin, Joe Pouzar, William Parkan and Ruby McDade; Office of the Comptroller, Marilyn Sampay, June Boeckel and Karen Budewitz; Space Shuttle Program Office, Linda Chauvin, David DeAtkine, Gregory Buoni and Jene Richart; Information Systems Directorate, Henri Daumas, Carlos Parra, James Doyle and Lui Wang; White Sands Test Facilities, John Mul-

holland; Space and Life Sciences Directorate, Timothy White, John James, Fred Spross, Jeffery Cardenas, Judith Robinson, David Lamar, Ricardo Sanchez, David Thompson and Barbara Woolford.

Following the ceremony, there will be a reception for award recipients and their guests.

Supervisors are encouraged to allow JSC civil service and contractor employees to attend a their workloads permit.

For further information regarding the ceremony, contact Helen Harris at x38413.

JSC

# Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

**Cowboys vs. Oilers:** Aug. 26, San Antonio. Tickets cost \$60, available on 20, 30-yard-line and end zone. Tickets include transportation.

**Sock Hop:** 50's Dinner and Dance Aug. 19 at the Gilruth Center. Tickets cost \$15.

**Schlitterbahn:** Tickets cost \$17.80 for adults and \$15.30 for children 3-11.

**Sea World:** Tickets cost \$23.50 for adults and \$16.25 for children 3-11.

**Six Flags:** Tickets cost \$23.70 for a one day pass, \$31.75 for two day pass and \$20.30 supersaver not valid on weekends in June July and August.

**Astroworld:** Tickets cost \$18.10.

**Waterworld:** Tickets cost \$9.25.

**Splashdown:** Tickets cost \$11.05. NASA family days Aug. 12-13. Tickets cost \$9.50.

**Fiesta Texas:** Tickets cost \$20.35 for adults and \$15.80 for children 4-11 and seniors over 55.

**Moody Gardens:** Discount tickets for two of three different attractions: \$9.50

**Space Center Houston:** Discount tickets, adult, \$8.75; child (3-11), \$7.10.

**Metro tickets:** Passes, books and single tickets available.

**Movie discounts:** General Cinema, \$4.75; AMC Theater, \$4; Sony Loew's Theater, \$4.75.

**Stamps:** Book of 20, \$6.40.

**JSC history:** *Suddenly, Tomorrow Came: A History of the Johnson Space Center.* Cost is \$11.

**Upcoming Events:** Caribbean Getaway Oct. 13-16.

JSC

# Gilruth Center News

**Sign up policy:** All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

**EAA badges:** Dependents and spouses may apply for photo identification badges from 7 a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

**Weight safety:** Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. Aug. 9 and Aug. 24. Pre-registration is required. Cost is \$5.

**Defensive driving:** Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is Aug. 5. Cost is \$19.

**Exercise:** Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays.

**Aerobics:** High/low impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32.

**Aikido:** Martial arts class meets from 5-7 p.m. Tuesdays and Wednesdays. Cost is \$25 per month. New classes begin the first of each month.

**Ballroom dancing:** Cost is \$60 per couple. For additional information call the Gilruth Center at x33345.

**Fitness program:** Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Wier at x30301.

JSC

# Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP2, or deliver them to the deposit box outside Rm. 181 in Bldg 2. No phone or fax ads accepted.

## Property

Sale/lease: Dickinson, 3-1.5-1 w/detached garage/workshop, .8 acre, trees, assumable, \$87k. x47180 or 301-1480.

Lease: Barringer Way condo, 2-1, W/D conn, pool, ex cond, no pets, \$495/mo. 486-2048.

Sale: Webster condo, 2-2-2cp, new A/C, appliance, FPL, ceiling fans, 3% down \$39.9k. 280-0285.

Sale/Rent: University Trace condo, 1 BR, 832 sq ft, FPL, W/D, ready 8/1, \$32k or \$450/mo. 286-1934.

Sale: Middlebrook, 3-2-2, oversized garage, 1,968 sq ft, \$99.5. Mary Ann, 414-9132.

Lease: CLC, 1 BR condo, W/D, FPL, sec alarm, cov'd parking, new carpet/blinds. Jim, Briley, x44632 or 488-7901.

Lease: Waterfront townhouse, 2-2.5-2, W/D, fans, security gate, 45' boat slip included/private marina, \$1.5k/mo. x35268 or 326-4915.

Sale: Taylor Lake Estates, wooded lot 90'x135', can finance, \$39.5 obo. Don, x38039 or 333-1751.

Lease: Sagemont, 4-2-2, lg yard, ceiling fans, new carpet, \$700/mo. John, 484-1658.

Rent: House, 3-2.5, W/D, refrig, alarm, Jacuzzi, \$1,050/mo + dep. 326-4618.

Lease: League City townhome, 3-2.5-1, 2-story, 1400 sq ft, sm fenced yard, appliance, \$800/mo. 469-7878.

Rent: BayWind II condo, 2-2, split plan, FPL, W/D, \$585/mo. Pete, x38614 or 480-4028.

Rent: Winter Park, Col. 2-2, furn, hot tub, heated pool, sleeps 6, low summer rates. 488-4453.

Rent: Arkansas cottage on Blue Mt Lake, huge stone FPL, screened porch, \$250/wkly \$50/dly. Corcoran, x33005 or 334-7531.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st St, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Rent: BayWind II condo, 2-2, split plan, FPL, W/D, \$585/mo. Pete, x38614 or 480-4028.

Rent: Winter Park, Col. 2-2, furn, hot tub, heated pool, sleeps 6, low summer rates. 488-4453.

Rent: Arkansas cottage on Blue Mt Lake, huge stone FPL, screened porch, \$250/wkly \$50/dly. Corcoran, x33005 or 334-7531.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st St, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Rent: BayWind II condo, 2-2, split plan, FPL, W/D, \$585/mo. Pete, x38614 or 480-4028.

Rent: Winter Park, Col. 2-2, furn, hot tub, heated pool, sleeps 6, low summer rates. 488-4453.

Rent: Arkansas cottage on Blue Mt Lake, huge stone FPL, screened porch, \$250/wkly \$50/dly. Corcoran, x33005 or 334-7531.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st St, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Rent: BayWind II condo, 2-2, split plan, FPL, W/D, \$585/mo. Pete, x38614 or 480-4028.

Rent: Winter Park, Col. 2-2, furn, hot tub, heated pool, sleeps 6, low summer rates. 488-4453.

Rent: Arkansas cottage on Blue Mt Lake, huge stone FPL, screened porch, \$250/wkly \$50/dly. Corcoran, x33005 or 334-7531.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st St, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Rent: BayWind II condo, 2-2, split plan, FPL, W/D, \$585/mo. Pete, x38614 or 480-4028.

'76 F-100 PU, \$1k. x31883.

'84 Mazda RX-7 GSL-SE, black/red, 5 spd, sunroof, AM/FM/cass, ex cond, \$2,950. 582-0415.

'91 Olds Cutlass Supreme, white, V6, A/C, AM/FM/cass, ex cond, \$6.2k. Liz, x32161 or 436-0116.

'89 Ford Mustang LX 5.0, 84k mi, alarm, PS/PB/PW, tilt, AM/FM stereo, runs good, \$5.2k. 479-4121.

'91 Subaru Legacy, auto, FWD, loaded, ex cond, 62k mi, \$8.1k. Ian, x34853.

'94 Camaro, maroon, A/C, cruise, AM/FM/cass, 36k mi, \$12.1k. x31443 or 997-8044.

'91 CRX, red, 5 spd, clean. Kyle, 996-1264.

'84 Volvo 760 Turbo, good cond, blue, sunroof, A/C, auto, AM/FM/cass, \$2.5k. Linda, x45134 or 286-8138.

'94 Toyota PU, 2WD, bedliner, garnet red, 11k mi, AM/FM/cass, ex cond, \$9.8k. 333-5900.

'87 Nissan 200-SX EX hatchback, red, auto, all pwr, cruise, sunroof, A/C, AM/FM/cass, 97k mi, ex cond, 1 owner, \$4.3k. 282-3229 or 286-4547.

'93 Dodge Ram PU ext cab, loaded, 390 V8, 2WD, camper shell, 29k mi, \$18k obo. 326-2866.

'81 Oldsmobile Delta 98, fair cond, 4 dr, full sz sedan, \$800 obo. Bryan, 286-7227.

'83 Cutlass Supreme, V8, great cond, A/C, \$1.5. Quan, x38304.

'91 240SX SE Coupe, white, tinted windows, 5 spd, loaded, \$12k. Quan, x38304.

## Cycles

'80 BMW R100T motorcycle, 1000cc, ex cond, new tires, helmets, det luggage, \$2.7k. 487-4440.

'85 Honda Rebel 250cc, ex cond, less than 1k mi, \$2.1k. Brenda, x30423 or 409-948-6793.

'78 PE dirt motorcycle, (3) \$1.1k. 332-7149.

Boys 24" bike, 21 spd, ex cond, make offer. 486-7909.

## Boats & Planes

Laser 2 sailboat w/trailer, spinnaker rigged, trap, vest, \$900. x41095 or 486-8185.

'91 Kawasaki 440 Jet ski, \$950. 919-3898.

Sunfish sailboat w/ 2 sets of sails, \$500 obo; BIC 200S Windsurfer w/ extra Wishbone, \$200 obo. Dick, 335-6842 or 286-4444.

'88 Searay 18' Bowrider, 130 hp I/O, galv trailer, pwr trim/tilt/steering, ex cond, outfitted for skiing, \$8k. 532-1673.

## Audiovisual & Computers

AIWA #AXR-004 stereo audio/video recvr w/ remote, \$120 obo; Sony CD player w/full function remote, \$100 obo. Lisa, x40213 or 554-4140.

TI-6400 computer, software. Fred, 944-3523.

Citizen printer "CSX-140" w/GSX color option, \$199. Magdi Yassa, 333-4760 or 486-0788.

486 DX2-66, 3 Mb RAM, 528 Mb HD, 1 Mb video, 14.4k fax modem, sound card, \$875; 15" SVGA monitor, \$250. x35549 or 554-7104.

Panasonic KXP-1090i computer printer, \$60; Supra fax modem 14.4, V32bis, external, \$60; Mark, x36126 or 326-1192.

Apple Imagewriter I, \$50; Apple Imagewriter II \$75. Ken, 283-9233 or 473-2602.

Stereo equip, Pioneer recvr, 160 watts, \$160;

JSC

# Dates & Data

## Today

**Cafeteria menu** — Special: tuna noodle casserole. Total Health: broiled chicken breast. Entrees: deviled crabs, broiled pollock, liver and onions, broiled chicken with peach half, Reuben sandwich. Soup: sea-food gumbo. Vegetables: Italian green beans, cauliflower au gratin, steamed rice, vegetable sticks.

## Monday

**Cafeteria menu** — Special: Italian cutlet. Total Health: herb flavored steamed pollock. Entrees: barbecue beef spare ribs, steamed pollock, baked chicken. French dip sandwich. Soup: black bean and rice. Vegetables: California mix, okra and tomatoes, vegetable sticks, ranch style beans.

## Tuesday

**Photo club meets:** The Bay Area Photo Club will meet at 7:30 p.m. Aug. 8 at the Faith Covenant Church. For more information call Kelly Prendergast at x37655.

**Cafeteria menu** — Special: spaghetti with meatballs. Total Health: baked potato. Entrees: stir fry beef, liver and onions, beef cannelloni, ham steak French dip sandwich. Soup: split pea. Vegetables: winter blend mix, seasoned cabbage, breaded squash, lima beans.

## Wednesday

**ABWA meets:** The American Business Woman's Association will meet at 11:30 a.m. Aug. 9 at the Holiday Inn on NASA Road 1. Certified Financial Planner Richard Hergert will discuss "Retirement Plans." For more information call Carolyn Wagner at 332-3413.

**SSFF meets:** The Space Station Future Fighters will meet at noon Aug. 9 at the Freeman Memorial Library at 16602 Diana. For information call David Cochran at 335-0185.

**MAES meets:** The Society of Mexican American Engineers and

Scientists will meet at 11:30 a.m. Aug. 9 in the executive dining room in the Bldg. 3 cafeteria. For more information call Michael Ruiz at x38169.

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Aug. 9 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at 333-7679.

**Toastmasters meet:** The Space-land Toastmasters will meet at 7 a.m. Aug. 9 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Elaine Trainor, x31034.

**Cycle club:** The Space City Cycle Club will meet for a 25-mile ride beginning at 6 p.m. Aug. 9 at the University of Houston Clear Lake soccer field. For more information on this ride and weekend rides call Mike Prendergast at x45164.

**Cafeteria menu** — Special: smoked barbecue link. Total Health: roast porkloin. Entrees: cheese enchiladas, roast pork and dressing, baked chicken, steamed pollock, Reuben sandwich. Soup: seafood gumbo. Vegetables: Italian green beans, Spanish rice, turnip greens, peas and carrots.

## Thursday

**Airplane club meets:** The MSC Radio Control Airplane Club will meet at 7:30 p.m. Aug. 10 at the Clear Lake Park Community Bldg. For more information call Bill Langdoc at x35970.

**Cafeteria menu** — Special: chicken fried steak. Total Health: roast beef with gravy. Entrees: steamed pollock, lasagna with meat, steamed pollock, catfish, French dip sandwich. Soup: cream of turkey. Vegetables: whole green beans, butter squash, cut corn, black-eyed peas.

## Friday

**Cafeteria menu** — Special: fried

chicken. Total Health: vegetable lasagna. Entrees: pollock hollandaise, beef stroganoff, vegetable lasagna. Vegetables: steamed broccoli, carrots vichy, Italian zucchini, breaded okra.

## Aug. 15

**NAT meets:** The National Technical Association will meet at 6:30 p.m. Aug. 15 at Texas Southern University School of Technology Rm. 316. For more information call Carrington Stewart at x31404.

## Aug. 16

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Aug. 16 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at 333-7679.

**Toastmasters meet:** The Space-land Toastmasters will meet at 7 a.m. Aug. 16 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Elaine Trainor, x31034.

**Cycle club:** The Space City Cycle Club will meet for a 25-mile ride beginning at 6 p.m. Aug. 16 at the University of Houston Clear Lake soccer field. For more information on this ride and weekend rides call Mike Prendergast at x45164.

## Aug. 22

**Photo club meets:** The Bay Area Photo Club will meet at 7:30 p.m. Aug. 22 at the Faith Covenant Church. For more information call Kelly Prendergast at x37655.

**BAPCO meets:** The Bay Area PC Organization will meet at 7:30 p.m. Aug. 22 at League City Bank. For more information call Guy Thibodeaux at 333-5340.

## Aug. 23

**NMA meet:** The National Management Association will meet at 5 p.m. Aug. 23 at the Gilruth. For more information call Kathy Kaminiski at x38706.

Magnepan M61 electrostatic spkrs, \$350 obo. x32567 or 488-3314.

Pioneer stereo, ex cond, 12 disc CD, spkrs, tape deck/recvr/turntable, cabinet, \$600. Sandi, x39283.

Goldstar Video cass player, \$65; Sears LXI 4 head hi-fi w/universal remote, \$140; Lloyds turntable plays 33s/45s/78s, \$60; AT&T cordless phone w/dial pad 7 spkr phones in base, \$55; TEAC Graphic equalizer, \$55; JVC tape deck w/Dolby NR, \$50. x42444 or 488-4382.

Panasonic CD/tuner, Denon 60W amp, coustic 120W amp, Carver 240W amp, Coustic active crossover. Larry, x34-6932.

Commodore 64 keyboard, modem, disk drive, joy sticks, lots of assorted software, \$75. 282-4078 or 339-2056.

2400 bps fax/modem, \$10; 3COM Ether Link II cards, \$10/ea; EGA monitor & 2 EGA cards, \$60. Terry, x36351 or 996-9164.

486/50 Lexmark SE-10 sub notebook, 4 Mb, 210 mg HD, 3.5" floppy, type II PC MCIA, IBM thinkpad twin w/acc & SW, new \$5k, sell \$950. 998-3398.

Licensed Excel 4.0 software for Macintosh w/ books, \$50. Rich May, x33745.

Licensed Excel 4.0 software for Macintosh w/ books, \$50. Rich May, x33745.

Licensed Excel 4.0 software for Macintosh w/ books, \$50. Rich May, x33745.

## Photography

Nikon 105 MM portrait lens w/case, \$125. Rich May, x33745.

## Musical Instruments

Clarinet, Selmer B flat, wood, ex cond, \$400 obo. Leah, x34544 or 480-8780.

Karl Hofnier & Tonklar the Dancla student, full sz violin w/case, need re-bow & strings, \$300 ea. x37445 or 488-4046.

## Pets & Livestock

AKC blk Chow puppies, 5 males/1 female, 5/25/95 avail after 7/13/95. Debbie, 334-5987.

Iguana, tame, male, 2.5' long, 40 gal tank, heat rock & fluorescent light, + 6 mos supplies, \$130. Merrell, x37570 or 286-9123.

Persian kittens, CFA reg, health guarantee, many colors, show or pet, \$200-\$300. 282-7494 or 480-4209.

## Lost & Found

Man's sportcoat found in Bldg 1, Rm 560, call to claim. x30479.

## Household

Antique vanity table w/round beveled mirror, \$300 obo; 2 antique armories, 1 w/beveled full length mirror on door, \$450 obo; 1 w/double doors, mirror on inside of door, \$350 obo. Margaret, x33666.

Amara refrigerator, 25 cu ft, almond, side-by-side, ice/watter dispenser, \$495. 471-9432.

Waterbed frame, kg sz, blk lacquer, motionless mat/heater, massage unit, \$500. Dan, x33003 or 480-6913.

Trundle bed, antique white, 2 matt, ex cond, \$200; love seat, floral pattern, ex cond, \$200. Steve, x36725.

Kenmore stackable W/D, \$400 obo. 286-7120.

Whirlpool gas cooktop, \$50; Whirlpool, 27" gas oven w/bottom broiler, Whirlpool built-in microwave,

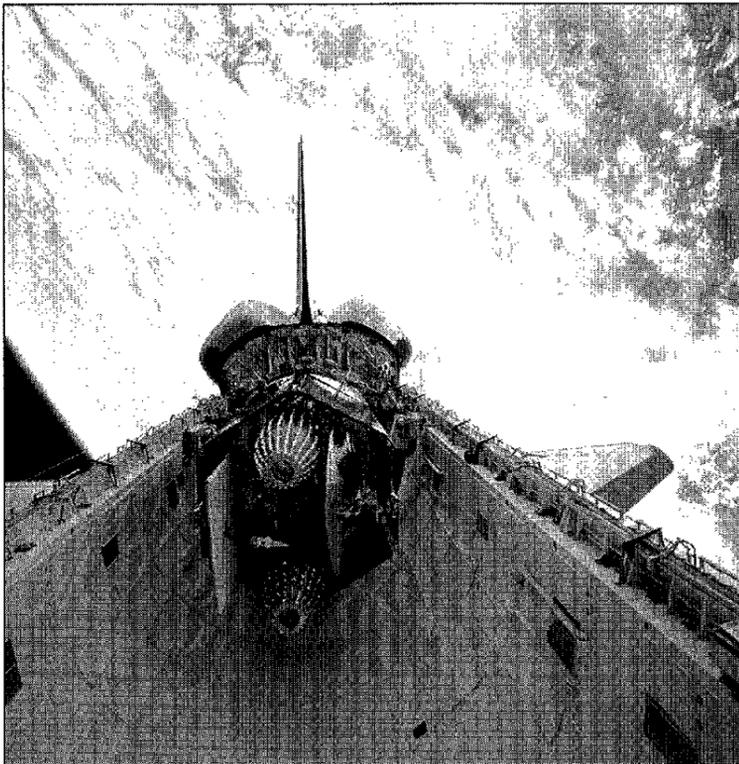
\$250/pr w/wall cabinet; toilet, \$10; steelcase metal office desk, 30x60, \$100; 30x60 & 30x44 metal office tables, \$25/ea; Wards microwave, \$25; Kenmore 20 cu ft upright freezer, \$225; Barcalounger/couch, 7' , both ends recline, ex cond, \$400. x31047 or 538-1077.

Babycrib, white, w/matt, \$50; Graco Pack-n-Play portable crib, \$35. Mike, x47753 or 482-0626.

Queen sz Shaker style waterbed frame w/mirrored hdbd & queen sz pillow-top conventional mattress, \$250. Mike, x47885 or 326-1097.

Electric oven, 27" G.E. coppertone built-in wall mount oven, works great, \$50. Linda, 484-0987.

Student desk, \$100; sm blue rocker, \$100; full sz bed frame, \$30; card table, solid oak, white washed, 4 padded chairs, \$300 firm. Sandi, x39283.



# Flawless Flight

## With no problems having occurred during STS-70 the crew and flight controllers laud it as the perfect mission



**T**he crew of *Discovery* returned home after a successful mission to deploy the Tracking and Data Relay Satellite and conduct a variety of mid-deck experiments. The TDRS completes a network of orbiting relay stations that will enhance communications for future space exploration. Experiments were conducted to determine how effective some equipment is for supporting tissue growth in microgravity.

Throughout the mission the crew collected in-flight photos to share. Top to Bottom, left to right:

1) The horizon of the blue and white Earth forms the background for this pre-deployment photo of the TRDS in *Discovery's* cargo bay. The five-member crew accomplished the TDRS deployment during their first day in space.

2) Mission Specialist Nancy Currie is pictured on *Discovery's* flight deck supporting the Microbial Capture Device. This device test microbial characterization of spacecraft potable water.

3) The traditional in-flight crew portrait was shot on *Discovery's* middeck with the Ohio flag as a backdrop. Left to right are Mission

Specialist Don Thomas and Currie, Commander Tom Henricks, Mission Specialist Mary Ellen Weber and Pilot Kevin Kregel.

4) Kregel activates the Window Experiment on the flight deck. This experiment was designed to help gain an understanding of the chemistry and dynamics near a Low-Earth-Orbit satellite. This type information is expected to prevent misinterpretation of the measurements of Earth, the solar system and stars from LEO platforms. This knowledge also will help prevent damage to sensitive systems and solar arrays during rendezvous and docking operations.

5) Thomas works out on the bicycle ergometer onboard *Discovery*.

6) Weber works with a syringe related to the Bioreactor Development System. The almost weightless state of space travel provides life science researchers with the opportunity to grow cells into three-dimensional tissue pieces that are not achievable using conventional tissue culture methods on Earth. At specified times during the STS-70 mission, crew members injected color producing substances to document fluid movement in the reactor, and

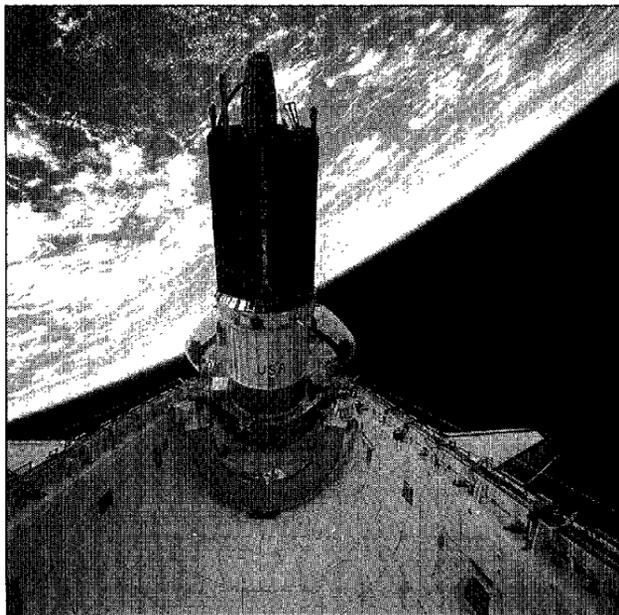
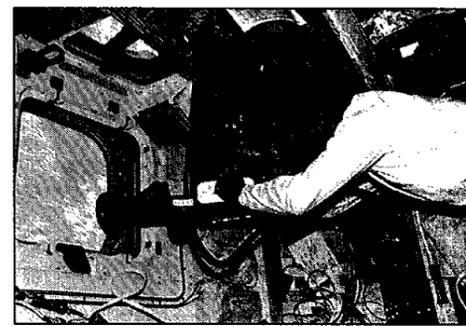
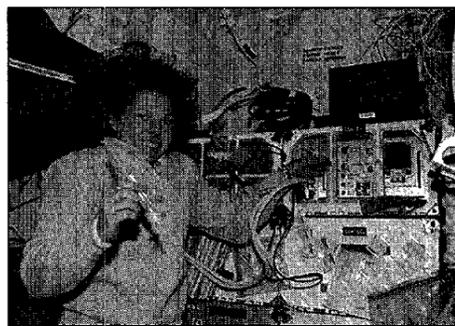
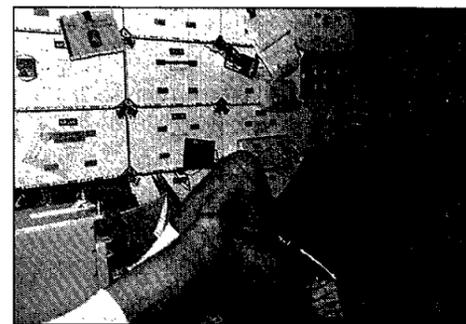
various-sized beads to estimate the tissue size that could be supported in the Bioreactor.

7) On *Discovery's* aft flight deck, Henricks aims toward a site on Earth with the TV camera and other hardware for the Hand-Held, Earth-Oriented, Cooperative, Real-Time, User-Friendly, Location-Targeting and Environmental System. Hercules-B, a first time flier, is the third generation of a space-based geolocating system. For this configuration, a XYBION multispectral camera has been integrated with the HERCULES geolocation hardware. The second generation—HERCULES-A—used NASA's Electronic Still Camera and was flown on missions STS-53 and STS-56. HERCULES-B allowed the system to respond to requirements that exploit multispectral techniques.

8) Henricks, still in his pressure suit, completes *Discovery's* ascent into low Earth orbit.

9) The TDRS and its Inertial Upper Stage are captured at the moment of release from *Discovery's* cargo bay.

10) Kregel and Currie perform an inflight maintenance procedure on the vacuum cleaner. □



NASA Photos

# Hubble sheds light on the "faint blue galaxy" mystery

International teams of astronomers using the Hubble Space Telescope have solved a 20-year-old mystery by showing that a class of galaxy once thought to be rare is actually the most common in the universe.

Analyzing some of the deepest images ever taken of the heavens, the astronomers conclude that small irregular objects called "blue dwarfs" were more numerous several billion years ago, outnumbering the spiral galaxies like our Milky Way, and giant elliptical galaxies as well. This means the blue dwarfs are a more important constituent of the universe and figure more prominently in the evolution of galaxies than previously thought, researchers say. The discovery was made by the international Medium Deep Survey team, led by Richard Griffiths of the Johns Hopkins University and extended by a deeper survey with Hubble Space Telescope by a team led by Rogier Windhorst of Arizona State University.

"The new results have overturned the conventional picture of a universe dominated by giant grand design spiral systems and elliptical galaxies," said Griffiths. "Instead, we're going to have to come up with a new way of understanding the distorted galaxies we see in huge numbers, which seem to have formed later than the giant galaxies."

However, they say it is not clear whether these small irregular systems are indeed the building blocks of galaxies like the Milky Way, or have simply faded into obscurity.

"Most of these faint objects are visibly blue in color, a strong indication that they are undergoing a brief, rapid burst of star-formation. At larger distances, such systems may well have been the building blocks of today's giant spiral and elliptical galaxies," said Windhorst, who along with William Keel of the University of

Alabama, conducted a separate survey of remote galaxies.

These faint galaxies were randomly imaged as part of a key Hubble Telescope project, called the "Medium Deep Survey." The survey uses Hubble's Wide Field/Planetary Camera-2 to search for unexpected objects in uncharted areas of the sky. This highly efficient and cost-effective survey is conducted in "parallel mode" where the WFPC-2 takes detailed pictures while a "primary" instrument, such as a spectrograph, collects data from a pre-determined celestial target. For the past 17 months, Griffiths and co-investigators from the United States and the United Kingdom have studied more than 50 random snapshots containing high resolution information for a total of tens of thousands of galaxies.

"We were immediately struck by the large numbers of irregular and peculiar galaxies in

these HST random images," Griffiths said.

An additional, deeper Hubble image, has further extended these results.

"At last Hubble has allowed crystal clear images of these extremely faint objects, and we find that our universe is dominated by distorted systems of stars," said Simon Driver of Arizona State University.

At the faintest limits more than half the galaxies seen are such systems.

"We all know that the (clear) sky during the day is blue—due to scattered sunlight—but if your eyes had much more sensitivity, they would also see a very dim blue glow in the sky at night caused by myriads of faint blue galaxies, the mysterious nature of which was unknown until we imaged them in detail with Hubble," said Windhorst. The researchers are now measuring the distances to these galaxies using the world's new generation of giant ground-based telescopes.

## EAA offers get-a-ways

The Employee Activities Association is sponsoring a three-day Caribbean cruise to the Bahamas and a week long adventure in Paris, France.

The cruise offers airfare from Houston and accommodations aboard the Nordic Empress a Royal Caribbean cruise ship.

"If you have never been on a cruise before, this is a perfect way to discover the wonders cruising and the Caribbean," said Ginger Gibson, president of the EAA.

The Nordic Empress will make two ports of call. The first stop will be Nassau, where travelers can visit the Ardastra Gardens, shop for native crafts, bask on the beach or explore coral reefs. The second port of call is a trip to Royal Caribbean's private island, CoCoCay. This island offers a variety of shops and exploration of underwater treasures.

The next stop of the EAA travel tour is Paris, France. A trip is scheduled for March 16-23, 1996. This one-week adventure includes, airfare, hotel accommodations, transportation to and from the airport, continental breakfast every day and a sightseeing trip of the famous French capitol.

If neither of these trips suits an employee's need, a travel fair is scheduled from 4-6:30 p.m. Aug. 15. The fair will feature 40 travel experts including airlines, tour companies and cruise lines.

Door prizes will be awarded every 30 minutes. The grand prize is a Delta Dream Vacation to Orlando, Fla. The package includes round-trip airfare on Delta Airlines, four day, three night stay at the Ramada Resort Maingate and an Alamo Rental car.

For more information on travel trips, call Dick McMinimy at x34037. For more information on the travel fair, call x35352.



From left, Steve Sokol and Chuck Capps shared the honor of hanging the STS-70 plaque in Mission Control. Sokol and Capps were joined by Larry Foy and Norm Talbott.

## Plaque hanging for STS-70

The STS-70 mission was not only the first flight of the new main engine, but also mark the beginning of a new era in mission control.

"The dedicated contributions from many facility programmers and flight controllers combined to make the transition to the new control center a reality for STS-70," said Rob Kelso, lead flight director.

After a successful landing back to the Kennedy Space Center, two individuals were chosen to represent their groups in the traditional plaque hanging ceremony. Chuck Capps, a ground controller, and Steve Sokol, of the Spaceflight Meteorology Group performed the honors. While Chuck Capps was instrumental in ensuring the network and remote payload centers were ready to support the Tracking and Data Relay Satellite deploy, all the GC team members had the

challenge of learning how to operate the new control center for the first time in 30 years. They went through exhaustive training in the new systems and developed the procedures for handing over between the two control rooms. The GC team included Capps, Larry Foy, Norm Talbot, Joe Aquino, George Egan, Melissa Blizzard, Mike Marsh, John Snider, John Wells and Jonnie Brothers.

Steve Sokol made several difficult weather calls leading to deorbit. The weather forced STS-70 to extend its mission an extra day. The next day, the same weather delayed landing until the second opportunity.

"The weather group is an integral part of our flight control team and is critical to the effectiveness of our mission control operation," said Rich Jackson, STS-70 ascent/entry flight director.

## WSF to grow thin films

(Continued from Page 1)

effect on Earth-bound communications systems. Gernhardt will pluck SPARTAN out of orbit on the fourth day of the mission.

The next day, Newman will take over operation of the Canadian-built robot arm, unberthing the Wake Shield Facility from its truss structure in the cargo bay to begin "cleansing" it of atomic oxygen particles as *Endeavour* streaks around the Earth at more than 17 thousand miles an hour.

The pristine condition of the WSF is vital to its ability to grow thin films during its 54-hour flight free. Those films, to be used to prove the technology concept for enhanced semiconductor production, will grow in a chamber on the wake side of the WSF, in what researchers say will be the most perfect vacuum environment ever created.

The WSF will also serve as a target for dozens of jet thruster firings right before its retrieval. Walker and Cockrell will fire the shuttle's jets at distances of 400, 300 and 200 feet of the saucer-shaped

satellite to collect data researchers have requested about the effect of plume impingement on orbital satellites. The Wake Shield will be left attached to the robot arm overnight following its retrieval for an experiment the next day involving the study of the effect of charged particles in low Earth orbit on orbiting spacecraft.

The final highlight of the mission will come two days before landing, when Voss and Gernhardt venture into *Endeavour's* cargo bay for a six-hour space walk, the second for the shuttle program this year.

Voss and Gernhardt will take turns evaluating the thermal improvements made to their spacesuits and will test tools and techniques which may be used in the construction of the space station.

One of the major activities will involve the evaluation of small tools and connectors on a task board mounted on the starboard side of the payload bay. Two similar, but even more intricate space walks, will be conducted on the STS-72 mission at the end of the year.

## Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

The Roundup office is located in Bldg. 2, Rm. 181. The mail code is AP2. The main Roundup telephone number is x38648 and the fax number is x45165.

Electronic mail messages should be sent to the editor, khumphri@gp301.jsc.nasa.gov or the associate editor, kschmidt@gp301.jsc.nasa.gov.

Editor ..... Kelly Humphries  
Associate Editor ..... Karen Schmidt

## Correction

A story in the July 28 edition of Space News Roundup incorrectly reported that John Rummel was named the new Acting Director of the Space and Life Sciences Directorate. Rummel was named Acting Deputy Director.

## Film library has new hours

The Film and Video Distribution Library located at 1020 Bay Area Blvd. is changing their hours of operation.

Effective Wednesday, the library will be open to everyone from 8 a.m.-5 p.m. Monday, Tuesday, Thursday and Friday. The office

will be open Wednesdays for news media only.

These new hours apply to all types of request including, telephone, fax and over-the-counter requests.

For additional information call the library at 486-9606.

## STS-70 crew briefing changed

The crew of STS-70 will receive its space flight medals and share flight memories with employees from 9-10 p.m. next Friday in Teague Auditorium.

Commander Tom Henricks, Pilot Kevin Kregel, Mission Specialists Nancy Currie, Don Thomas and

Mary Ellen Weber will discuss the Tracking and Data Relay Satellite deployment and other science experiments they conducted during their mission on board *Discovery*.

The crew will brief the public from 11 a.m. Wednesday at Space Center Houston.

## Stockman speaks to NMA

The NASA JSC Chapter of the National Management Association will host a joint meeting of local NMA chapters beginning at 5 p.m. Aug. 23 at the Gilruth Center.

Guest speaker will be U.S. Congressman Steve Stockman, R-Texas. The spotlight speaker will be

Mission Operations Director John O'Neill.

NMA members may make reservations with their respective chapter's boosters prior to Aug. 16. Guests who wish to attend may contact Kathleen Kaminski at x38706 or Dave Kissinger at x30024.

## Russian classes available

Russian language classes from basic beginners to advance classes are now available.

The classes will be conducted from 7-9 p.m. four days a week at the Clear Lake United Methodist Church, 16335 El Camino Real. Cost is \$105 for a 10-week course.

Intermediate classes will be held on Mondays and the first class is

this Monday. Other classes began this week, but interested individuals are encouraged to attend beginning next week.

Beginners classes are held on Tuesday, Basic Beginners on Wednesday and Advanced Classes on Thursday.

For more information call Libby Troell at x37193.

## Congress supports station

(Continued from Page 1)

the United States continue to demonstrate their strong support for this vitally important program and for continued U. S. leadership in space and space technology," said Doug Stone, vice president of Boeing Space Station. "Over the past year, our team has done what we said we would do. We are on schedule, on budget and maintaining a stable technical baseline. We interpret the vote to be strong encouragement from Congress to continue on our present path."

The large vote margins seen last week were unexpected, due in large part to general uncertainty about the mood of the 104th Congress for drastic budget cuts and the widespread concern about deficit reduction. In addition, the lack of voting history among the 89 freshman members, made it difficult to feel any real measure of certainty about the outcome—at least about the margin of the vote.

As it happened, on last week's amendment, the vote among freshmen members was 68 to 20, with one absentee, in favor of the station or just under 76 percent. This compares with 56 percent of the previous freshmen class, in the 103rd Congress, who supported the station in the 1994 vote on the amendment. The next step is for the U.S. Senate to consider the appropriations bill, probably in September.

Comparing the make-up of the last two amendment votes—1994 and 1995—there appears to be growing stability across the various voting blocks within the Congress.

What is it that has led the International Space Station from a near-death experience in 1993 to the two-thirds majorities it now enjoys? In the face of the severe limitations of funds, and the competing demands for those funds, it is increasingly rare to find agreement across such a range of interests. Yet, it seems clear and unmistakable that there is a growing consensus in support of the space station and its value and potential for valuable scientific research.

There also seems to be a consensus and assurance that the space station program is on time, on budget and operating with a redesigned and efficient management structure as well as a redesigned vehicle.

Another key factor in the growth of support appears to have been NASA Administrator Daniel S. Goldin's effectiveness in dealing with members of Congress. Over the last several months, Goldin has personally taken the message of the "leaner and meaner" NASA to a large number of members who previously had serious reservations about the space station. The vote results indicate that, of the members he visited, more than 82 percent voted to support the space station.